

IN THE CLAIMS:

Claim 1. (Currently Amended) A microfluidic device for operations at high field strengths comprising:
a substrate having at least one channel and at least one aperture in fluid communication with said channel;
a cover bonded to said substrate such that a reservoir is formed at said at least one aperture; and
a driving electrode used to apply a field of at least 400 V/cm comprised of an electrically conducting silver/silver chloride ink pattern on at least one of said substrate and cover such that when a material is present in said channel and reservoir said ink pattern makes electrical contact with said material.

Claim 2. (Original) The device of claim 1 wherein said ink pattern is on said cover.

Claim 3. (Original) The device of claim 1 wherein said electrical contact is made in said reservoir.

Claim 4. (Previously Presented) The device of claim 1 comprising a first channel, a second channel, and a third channel, the first and second channel being fluidly connected to the third channel at separate points along the third channel and wherein said electrical contact is made in one of the first channel, second channel, and third channel.

Claim 5. (Currently Amended) The device of claim 1 wherein said cover is bonded to said substrate by one method selected from the group consisting of thermal bonding, using an adhesive and using a double-sided adhesive layer.

Claims 6-7. (Canceled)

Claim 8. (Previously Presented) The device of claim 1 wherein said material is a substance useful in electrophoretic applications.

Claim 9. (Previously Presented) The device of claim 1 wherein said ink pattern is on said substrate.

Claim 10. (Currently Amended) The device of claim 1 wherein said ink is patterned on said cover using one method selected from the group consisting of ink jet printing, screen printing and lithography.

Claims 11-13. (Canceled)

Claim 14. (Previously Presented) The device of claim 1 wherein said cover is made of PMMA.

Claim 15. (Previously Presented) The device of claim 1 wherein said ink is an acrylic-based silver/silver chloride ink.

Claim 16. (Previously Presented) The device of claim 1 wherein said ink is a polyester based silver/silver chloride ink.

Claim 17. (Previously Presented) The device of claim 1 wherein said ink pattern has width of 10 to 400 μm .

Claim 18. (Previously Presented) The device of claim 1 wherein said ink pattern includes a contact and a lead.

Claims 19-20. (Canceled)

Claim 21. (Previously Presented) The device of claim 1 wherein said substrate is made from a plastic selected from the group consisting of norbornene, polystyrene, acrylic, polycarbonate-polyester, and polyolefin.

Claim 22. (Previously Presented) The device of claim 1 wherein said substrate is a norbornene based substrate.

Claims 23-24. (Canceled)

Claim 25. (Currently Amended) A method for reducing bubble formation during electrokinetic applications in a microfluidic device having interconnected channels and reservoirs, said method comprising the steps of:

providing at least two driving electrodes for contacting a medium in said channels and reservoirs when the medium is present, wherein at least one driving electrode has a surface comprising silver and silver chloride; and

~~applying a voltage~~ establishing a field of at least 400 V/cm across the at least one driving electrode having a surface comprising silver and silver chloride and another driving electrode such that fewer bubbles form in said channels and reservoir as are formed when ~~applying~~ establishing said ~~voltage~~ field across driving electrodes of bare platinum.

Claim 26. (Previously Presented) The method of claim 25 wherein said microfluidic device comprises a substrate and a cover bonded to said substrate and wherein said electrodes are integrated electrodes formed using an ink patterned on said cover such that when said cover is bonded to said substrate to form said device said ink is positioned in said reservoir and makes electrical contact with said medium therein.

Claim 27. (Currently Amended) The method of claim 25 wherein ~~an electrode at least one of said electrodes~~ is positioned in one of said reservoirs to make electrical contact with said medium in said reservoirs and wherein said electrode comprises a silver/silver chloride coated electrode.

Claim 28. (Currently Amended) The method of ~~claim 25~~ claim 26 wherein the ink is an acrylic-based silver/silver chloride ink.

Claim 29. (Currently Amended) The method of ~~claim 25~~ claim 26 wherein the ink comprises a polyester-based silver/silver chloride ink.

Claims 30-44. (Canceled)